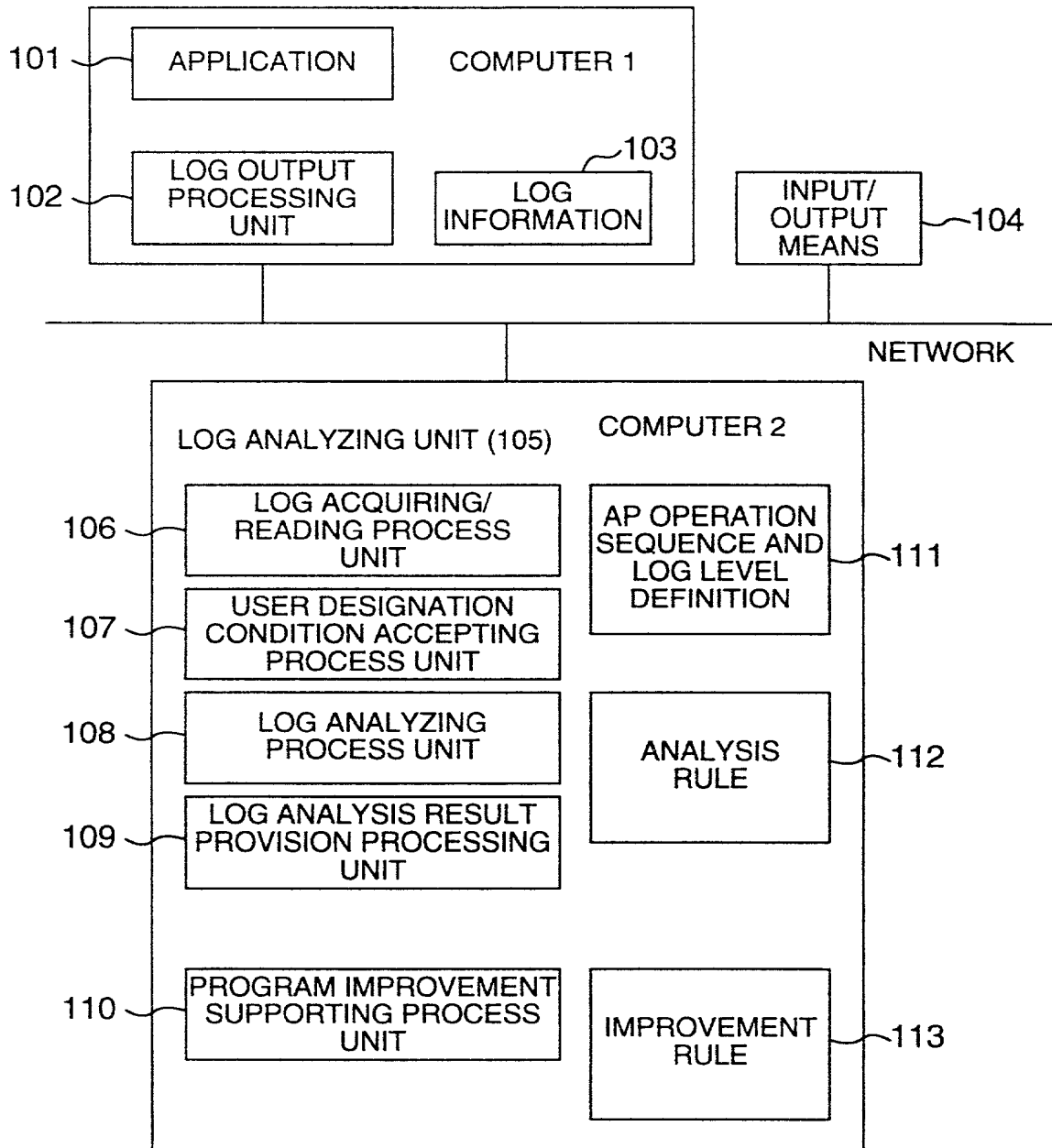


FIG. 1



Applicant: Yumiko Seki, et al.

Title: Log Analyzing Method, Execution Apparatus of the Same,...

Atty Docket No. 16869S-038400

Sheet 2 of 12

FIG. 2

EXAMPLE OF LOG INFORMATION (103)

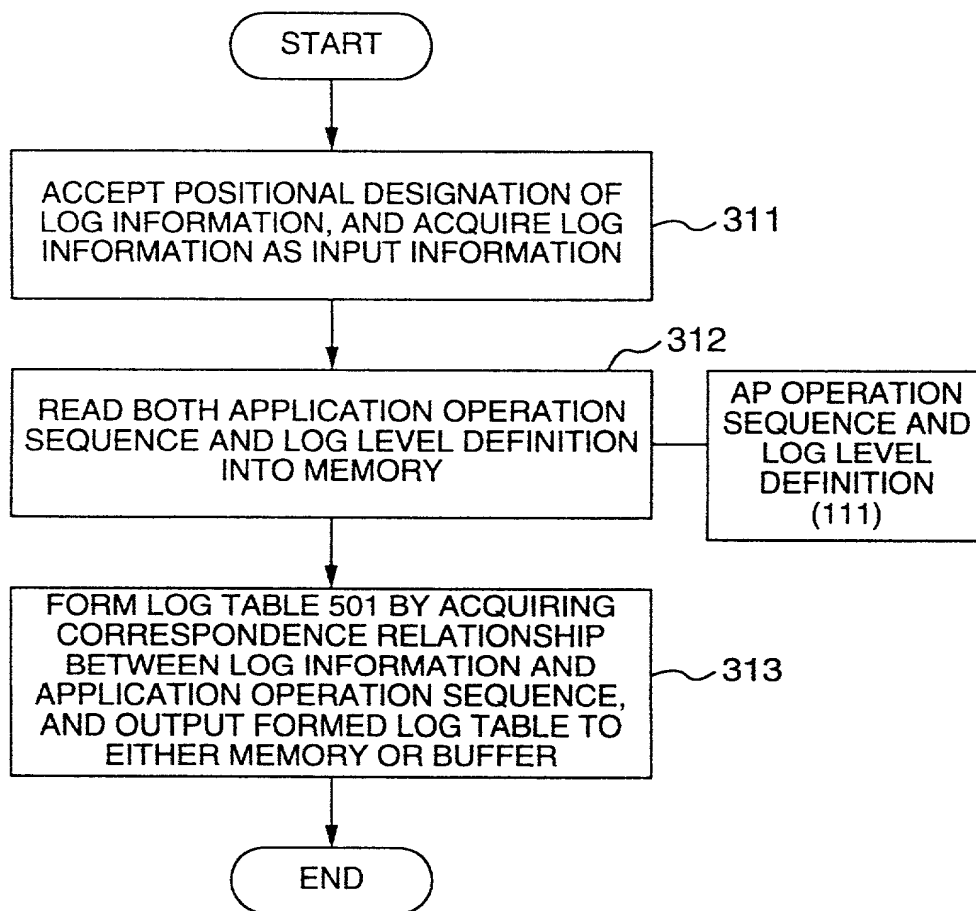
```

01 ***** Initialize Information *****
02 Log output file name: logout1.txt
03 Log level definition: 1,2,3,4,5,L: Log output definition: default
04 Application: start: time 00.00.00: CPU status 3%
05 *****
06 Method-A: Log level=1,M,Log output=default
07 Method-A: start: time 00.00.00: end time 00.00.08: maximum CPU status 3%
08 Method-A: connect: start time 00.01.26: end time 00.03.05: maximum CPU
    status 51%
09 Method-A:create object: start time 02.45.22: end time 02.45.57: maximum
    CPU status 35%
10 Method-A: commit: start time 02.47.14: end time 02.47.17: maximum CPU
    status 60%
11 Method-A: disconnect: start time 08.00.04: end time 08.00.05: maximum CPU
    status 15%
12 Method-A: exit: start time 10.29.72: end time 10.29.73: maximum CPU status
    5%
13 *****
14 Method-C: Log level=1,Π, Log output=default
15 Method-C: start: start time 15.25.07: end time 15.25.08: maximum CPU
    status 3%
16 Method-C: get object: start time 15.32.10: end time 15.33.17: maximum CPU
    status 3%
17 Method-C: error: time 16.21.00: CPU status 85%: error code 2178 error
    information 2199.3875.245 "invalid operation"
18 Method-C: exit: time 18.11.17: CPU status 80%: error return value
19 *****
20 Application: exit: time 18.36.25: CPU status 3%: error code 2178 in Method-C
    message "invalid operation"

```

FIG. 3

LOG ANALYZING/READING PROCESS (106)



Applicant: Yumiko Seki, et al.

Title: Log Analyzing Method, Execution Apparatus of the Same,...

Atty Docket No. 16869S-038400

Sheet 4 of 12

FIG. 4

EXAMPLE OF AP OPERATION SEQUENCE AND LOG LEVEL DEFINITION (111)

401

LOG LEVEL DEFINITION (411)	OPERATION SEQUENCE (412) OF DOCUMENT PROCESS APPLICATION
1	ACCESS PROCESS OPERATION TO DOCUMENT DATABASE
2	UPDATE PROCESS OPERATION TO DOCUMENT DATABASE
3	NEWLY FORMING OF DOCUMENT DATA
4	ACCESS PROCESS OPERATION TO DOCUMENT DATA
5	DELETION OF DOCUMENT DATA
6	EXCLUSIVE PROCESS OPERATION OF DATA
7	EXCLUSIVE PROCESS OPERATION OF DATABASE

402

OPERATION SEQUENCE (412) OF DOCUMENT PROCESS APPLICATION		OPERATION COMMAND (413)
ACCESS PROCESS OPERATION TO DOCUMENT DATABASE	CONNECT	CONNECT
	DISCONNECT	DISCONNECT
	QUERY	QUERY
UPDATE PROCESS OPERATION OF DOCUMENT DATABASE	COMMIT	COMMIT
	ROLLBACK	ROLLBACK
NEWLY FORMING PROCESS OF DOCUMENT DATA		CREATE
ACCESS PROCESS OPERATION TO DOCUMENT DATA	ACQUIRE	GET
	EDIT	EDIT
	END	CLOSE, SUBMIT
	COPY	COPY
DELETION PROCESS OPERATION OF DOCUMENT DATA		DELETE
EXCLUSIVE PROCESS OPERATION OF DATA		LOCK
EXCLUSIVE PROCESS OPERATION OF DATABASE		LOCKDB

Applicant: Yumiko Seki, et al.

Title: Log Analyzing Method, Execution Apparatus of the Same,...

Atty Docket No. 16869S-038400

Sheet 5 of 12

FIG. 5

LOG TABLE (501)

START OF DOCUMENT PROCESS APPLICATION	APPLICATION INITIAL SETTING INFORMATION
START OF PROCESS OPERATION A	INITIAL SETTING INFORMATION OF PROCESS OPERATION A
PROCESS OPERATION A	ACCESS PROCESS OPERATION (CONNECT) TO DOCUMENT DATABASE
PROCESS OPERATION A	NEWLY FORMING OF DOCUMENT DATA
PROCESS OPERATION A	UPDATING OF DOCUMENT DATABASE
PROCESS OPERATION A	ACCESS PROCESS OPERATION (DISCONNECT) TO DOCUMENT DATABASE
END OF PROCESS OPERATION A	NORMAL END INFORMATION
START OF PROCESS OPERATION C	INITIAL SETTING INFORMATION OF PROCESS OPERATION C
PROCESS OPERATION C	ACCESS PROCESS OPERATION (ACQUIRE) TO DOCUMENT DATA
PROCESS OPERATION C	ERROR: ABNORMAL END CAUSED BY UNAUTHORIZED PROCESS OPERATION
END OF PROCESS OPERATION C	ABNORMAL END INFORMATION
END OF DOCUMENT PROCESS APPLICATION	ABNORMAL END INFORMATION

FIG. 6

EXAMPLE OF USER DESIGNATION OF USER DESIGNATION CONDITION
ACCEPTING PROCESS OPERATION (107)

601

LOG INFORMATION TO BE EXTRACTED	OPERATION SEQUENCE (412) OF DOCUMENT PROCESS APPLICATION
YES NO	ACCESS PROCESS OPERATION TO DOCUMENT DATABASE
YES NO	UPDATE PROCESS OPERATION TO DOCUMENT DATABASE
YES NO	NEWLY FORMING OF DOCUMENT DATA
YES NO	ACCESS PROCESS OPERATION TO DOCUMENT DATA
YES NO	DELETION OF DOCUMENT DATA
YES NO	EXCLUSIVE PROCESS OPERATION OF DATA
YES NO	EXCLUSIVE PROCESS OPERATION OF DATABASE

FIG. 7

LOG ANALYZING PROCESS OPERATION (108)

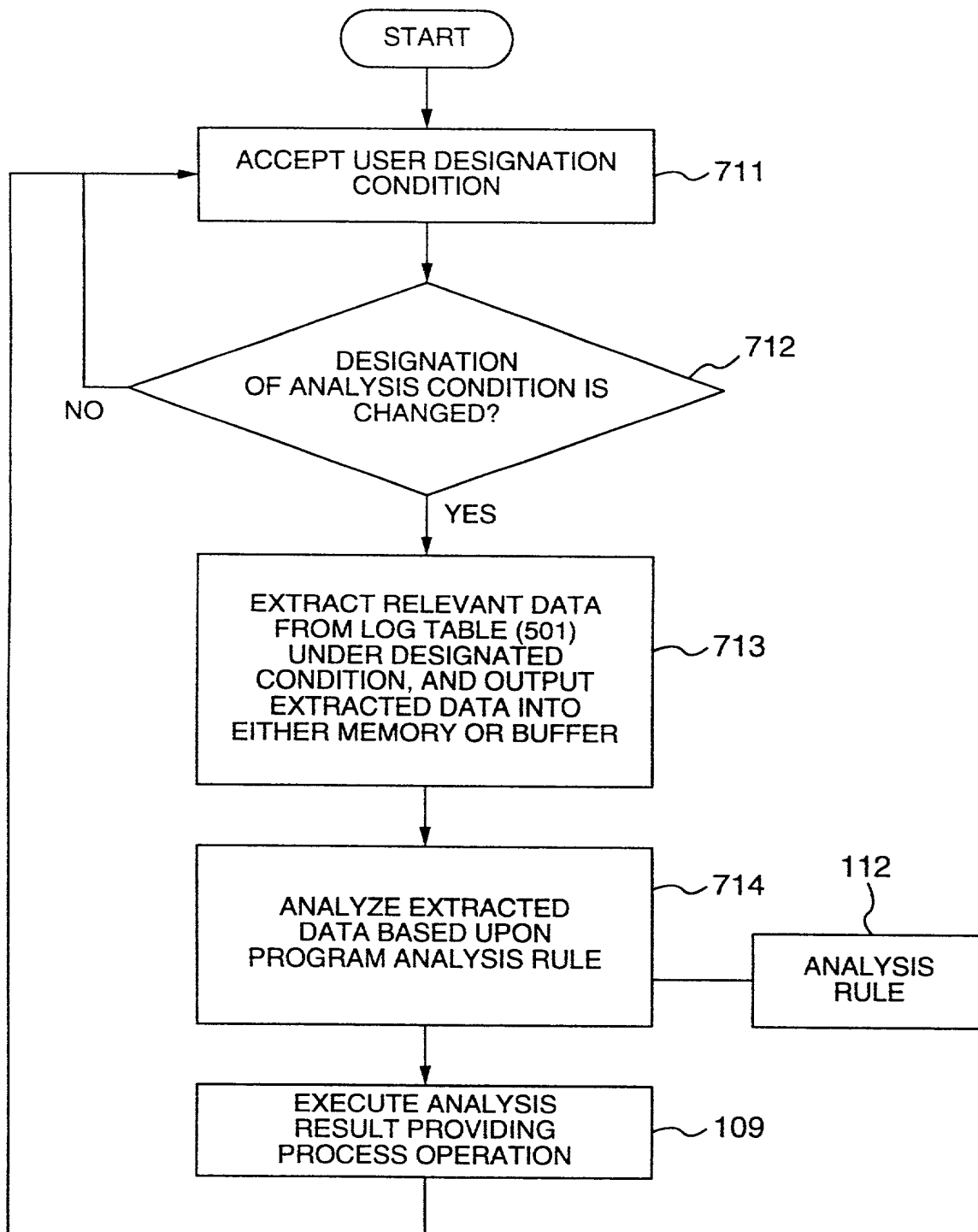


FIG. 8

EXAMPLE OF EXTRACTED RESULT BY LOG ANALYZING PROCESS (108)

801

PROCESS OPERATION A	ACCESS PROCESS OPERATION (CONNECT) TO DOCUMENT DATABASE
PROCESS OPERATION A	NEWLY FORMING OF DOCUMENT DATA
PROCESS OPERATION A	UPDATING OPERATION TO DOCUMENT DATABASE
PROCESS OPERATION A	ACCESS PROCESS OPERATION (DISCONNECT) TO DOCUMENT DATABASE
PROCESS OPERATION C	ACCESS PROCESS OPERATION (ACQUIRE) TO DOCUMENT DATA
PROCESS OPERATION C	ERROR: ABNORMAL END CAUSED BY UNAUTHORIZED PROCESS OPERATION

FIG. 10

ANALYSIS RESULT PROVISION EXAMPLE BY LOG ANALYSIS RESULT PROVIDING PROCESS OPERATION (109)

APPLICATION EXECUTION RESULT:
DOCUMENT PROCESS APPLICATION IS ENDED UNDER ABNORMAL STATUS. THIS IS BECAUSE EVENT "ABNORMAL END" HAPPENS TO OCCUR IN AN XX-TH COLUMN OF PROCESS OPERATION C
(OPERATION IN PROCESS OPERATION C IS TO ACQUIRE DATA, AND COMMAND IS "get object")

1001

CAUSE:
CONNECTION TO DOCUMENT DATABASE IS DISCONNECTED IN PROCESS OPERATION A BEFORE DATA ACQUIRING OPERATION OF PROCESS OPERATION C

1002

Applicant: Yumiko Seki, *et al.*

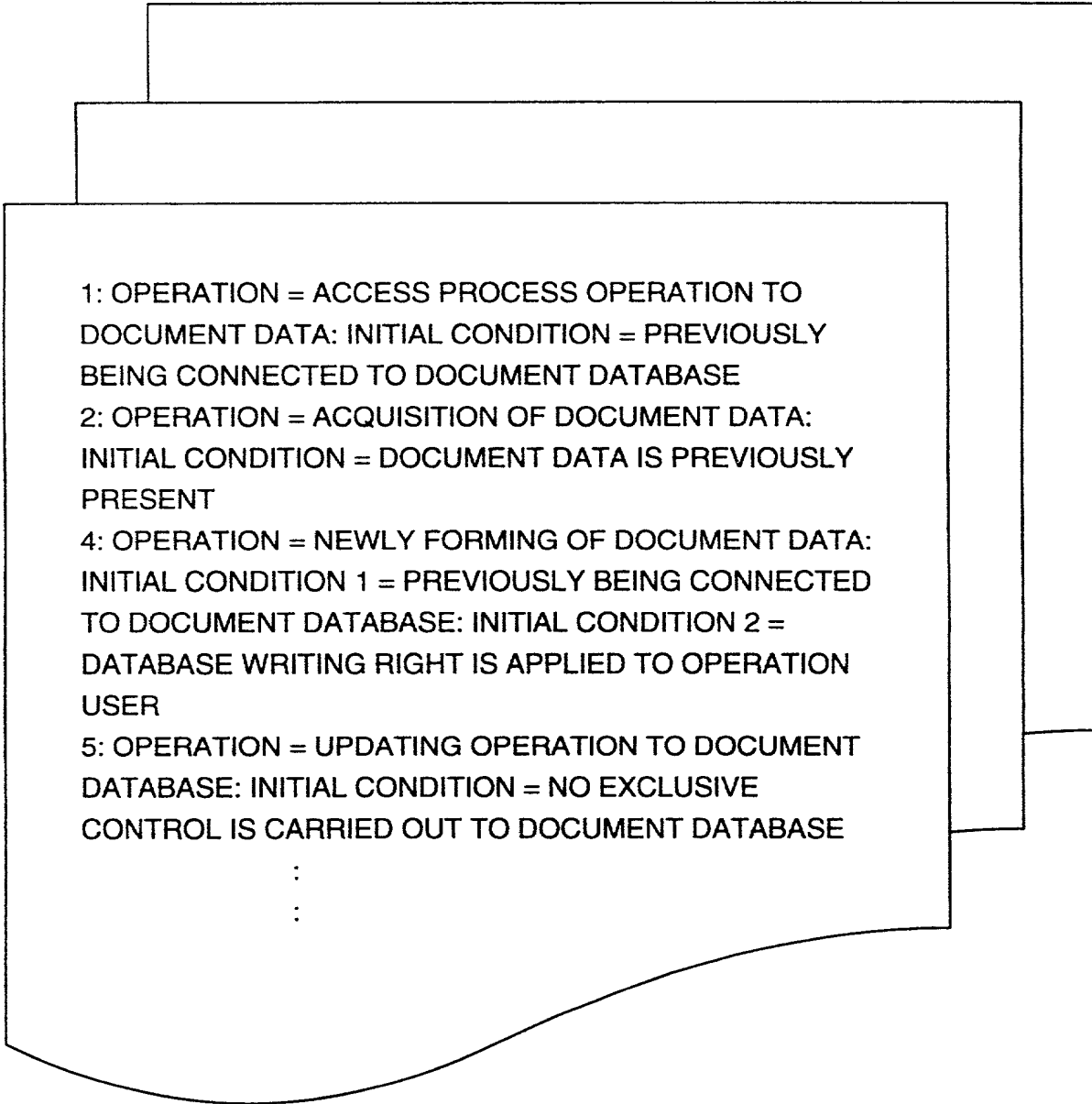
Title: Log Analyzing Method, Execution Apparatus of the Same,...

Atty Docket No. 16869S-038400

Sheet 8 of 12

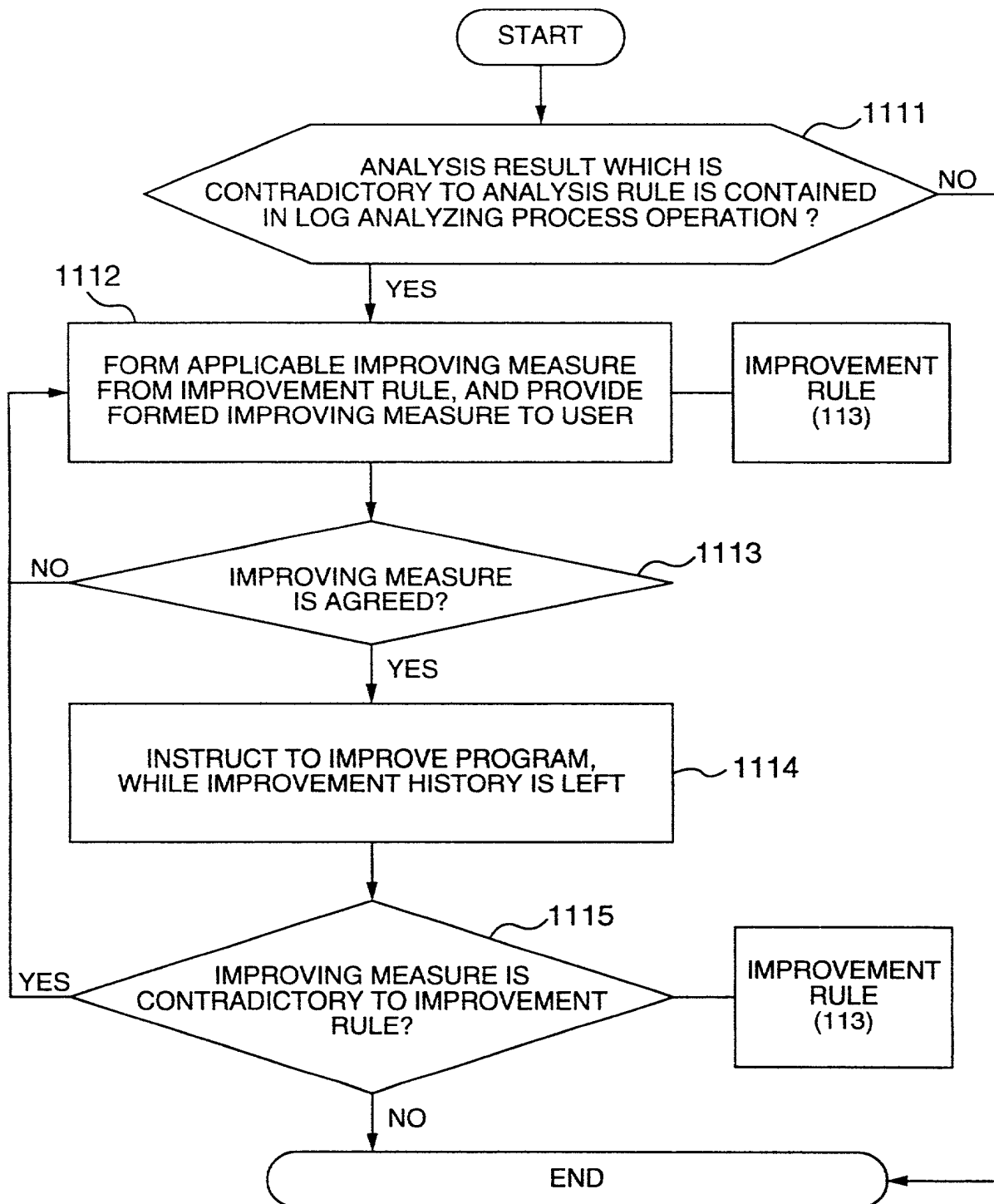
FIG. 9

EXAMPLE OF ANALYSIS RULE (112)

- 
- 1: OPERATION = ACCESS PROCESS OPERATION TO DOCUMENT DATA: INITIAL CONDITION = PREVIOUSLY BEING CONNECTED TO DOCUMENT DATABASE
 - 2: OPERATION = ACQUISITION OF DOCUMENT DATA: INITIAL CONDITION = DOCUMENT DATA IS PREVIOUSLY PRESENT
 - 4: OPERATION = NEWLY FORMING OF DOCUMENT DATA: INITIAL CONDITION 1 = PREVIOUSLY BEING CONNECTED TO DOCUMENT DATABASE: INITIAL CONDITION 2 = DATABASE WRITING RIGHT IS APPLIED TO OPERATION USER
 - 5: OPERATION = UPDATING OPERATION TO DOCUMENT DATABASE: INITIAL CONDITION = NO EXCLUSIVE CONTROL IS CARRIED OUT TO DOCUMENT DATABASE

:
:

FIG. 11

EXAMPLE OF PROGRAM IMPROVEMENT SUPPORTING
PROCESS OPERATION (110)

Applicant: Yumiko Seki, et al.

Title: Log Analyzing Method, Execution Apparatus of the Same,...

Atty Docket No. 16869S-038400

Sheet 10 of 12

FIG. 12

EXAMPLE OF IMPROVEMENT RULE (113)

IMPROVEMENT 1: WHEN OPERATION ERROR OCCURS =
INITIAL CONDITION IS INSERTED BEFORE OPERATION
IMPROVEMENT 2: WHEN OPERATION ERROR OCCURS =
PROCESS OPERATION OPPOSITE TO INITIAL CONDITION
BEFORE OPERATION IS DELETED
IMPROVEMENT 3: WHEN OPERATION RIGHT ERROR
OCCURS = AUTHORIZED ACCESS RIGHT IS APPLIED
IMPROVEMENT 4: WHEN OPERATION RIGHT ERROR
OCCURS = NOTIFICATION IS ISSUED TO USER WHO OWNS
AUTHORIZED ACCESS RIGHT
:
IMPROVEMENT N: IN THE CASE THAT AS A RESULT OF
IMPROVEMENTS, A SHORTAGE/EXCESS OF COMMAND
CONTENT IS PRODUCED IN BELOW-MENTIONED RELATIVE
COMMAND, INSTRUCTION IS MADE SO AS TO INSERT,
OR DELETE RELEVANT COMMAND

LIST OF RELEVANT COMMANDS:

CONNECT AND DISCONNECT TO/FROM DATABASE

DISCONNECT FROM DATABASE AND UPDATE
DATABASE

NEWLY FORMING OF DOCUMENT DATA, AND
FORMING OF PROPERTY

ACCESS PROCESS OPERATION TO DOCUMENT
DATA, AND UPDATING OF DATABASE
:

Applicant: Yumiko Seki, et al.

Title: Log Analyzing Method, Execution Apparatus of the Same,...

Atty Docket No. 16869S-038400

Sheet 11 of 12

FIG. 13

EXAMPLE OF IMPROVING MEASURE PROVISION BY PROGRAM
IMPROVEMENT SUPPORTING PROCESS OPERATION (110)

APPLICATION EXECUTION RESULT:
DOCUMENT PROCESS APPLICATION IS ENDED UNDER
ABNORMAL STATUS. THIS IS BECAUSE EVENT "ABNORMAL
END" HAPPENS TO OCCUR IN AN XX-TH COLUMN OF
PROCESS OPERATION C

(OPERATION IN PROCESS OPERATION C IS TO ACQUIRE
DATA, AND COMMAND IS "get object")

1001

CAUSE:
CONNECTION TO DOCUMENT DATABASE IS DISCONNECTED
IN PROCESS OPERATION A BEFORE DATA ACQUIRING
OPERATION OF PROCESS OPERATION C

1002

IMPROVING MEASURE 1:
CONNECT PROCESS OPERATION TO DOCUMENT
DATABASE IS INSERTED BEFORE DATA ACQUISITION
OPERATION OF PROCESS OPERATION C YES NO

1301

IMPROVING MEASURE 2:
CONNECT/DISCONNECT PROCESS OPERATION OF
PROCESS OPERATION C WITH RESPECT TO DOCUMENT
DATABASE IS DELETED? YES NO

1302

Applicant: Yumiko Seki, et al.

Title: Log Analyzing Method, Execution Apparatus of the Same,...

Atty Docket No. 16869S-038400

Sheet 12 of 12

FIG. 14

PROVISION EXAMPLE (WHEN IMPROVING MEASURE 1 IS SELECTED) OF
PROGRAM IMPROVEMENT SUPPORTING PROCESS OPERATION (110)

APPLICATION EXECUTION RESULT:
DOCUMENT PROCESS APPLICATION IS ENDED UNDER
ABNORMAL STATUS. THIS IS BECAUSE EVENT "ABNORMAL
END" HAPPENS TO OCCUR IN AN XX-TH COLUMN OF
PROCESS OPERATION C

(OPERATION IN PROCESS OPERATION C IS TO ACQUIRE
DATA, AND COMMAND IS "get object")

1001

CAUSE:
CONNECTION TO DOCUMENT DATABASE IS DISCONNECTED
IN PROCESS OPERATION A BEFORE DATA ACQUIRING
OPERATION OF PROCESS OPERATION C

1002

IMPROVING MEASURE 1:
CONNECT PROCESS OPERATION TO DOCUMENT
DATABASE IS INSERTED BEFORE DATA ACQUISITION
OPERATION OF PROCESS OPERATION C YES NO

1301



WARNING:
ADD PROCESS OPERATION FOR DISCONNECTING
CONNECTION TO DOCUMENT DATABASE, WHICH IS
INSERTED BEFORE DATA ACQUISITION OPERATION OF
PROCESS OPERATION C

1401